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7	4	29/841.ccls. and IC and stacking	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/08/05 15:02
8	0	29/841.ccls. and "PEM" and stacking	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/08/05 15:02
9	0	29/841.ccls. and "PEM"	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/08/05 15:02
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20	13	encapsulant and circuit and stacking and 439/\$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/08/05 15:08
18	10	encapsulant and circuit and stacking and 228/\$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/08/05 15:08
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-	2	5086018.pn.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/08/05 14:59
-	2	6342398.pn.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/08/05 13:45
-	2	6060373.pn.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/08/05 13:45
-	3	5454160.pn.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/08/05 13:45
-	7	microcircuit and package and stacking and 29/\$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/08/05 13:59

US-PAT-NO: 5552963

DOCUMENT-IDENTIFIER: US 5552963 A

TITLE: Bus communication system for stacked high density integrated circuit packages

DATE-ISSUED: September 3, 1996

INVENTOR-INFORMATION:

NAME CODE COUNTRY	CITY	STATE	ZIP
Burns; Carmen D. N/A	Austin	TX	N/A

US-CL-CURRENT: 361/735; 257/686 ; 257/692 ; 257/777 ;
29/827 ; 438/109

ABSTRACT:

The present invention is a rail-less bus system for a high density integrated circuit package, or module, made up of a plurality of vertically stacked high density integrated circuit devices. Each device has leads extending therefrom with bifurcated or trifurcated distal lead ends which electrically connect with lead ends of adjacent integrated circuit devices. The bus system provides a path for communication from the module to external electronic devices and internal communication between the individual integrated circuit devices in the module.

1 Claims, 10 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 5

CLAIMS:

What is claimed is:

1. An integrated circuit module, comprising:

an assembly of integrated circuit packages, each of said packages having an upper and a lower surface and a perimeter edge; each of said packages including an integrated circuit die and a plurality of electrical leads coupled to said die and extending through said perimeter edge; said packages being mounted within said module with the lower surface of one adjacent the upper surface of another in stacked configuration so as to align said electrical leads of one of said packages with those of another of said packages; some of said lead being bifurcated at their distal end to provide an upper and a lower lead extension; wherein upper and lower lead extensions from adjacent packages are electrically and thermally coupled; wherein said bifurcated lead extensions comprise a first and a second lead end finger; and wherein said first or said second lead end finger on the leads of at least one of said stacked integrated circuit packages is electrically connected to a first or second lead end finger of the leads of an adjacent integrated circuit package . and the remaining lead end finger is electrically connected to a lead end finger of the leads of another adjacent integrated circuit package.